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EXAMINER	
MATTIS, JASON E	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/694,766	GRINDAHL ET AL.	
	Examiner	Art Unit	
	Jason E Mattis	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58 and 60-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-58 and 60-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4, 5, 6, 7, 8*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in reference to the response to restriction requirement filed on February 19, 2004. Applicant elected the claims of Group I: consisting of claims 1-58 and 60-63. Claim 59 was cancelled by the applicant.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 8, 11, and 58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Lines 1-3 of **claim 8** state "a ratio of the radius of the coverage area times a data rate for the wireless communications divided by an attenuation loss of the wireless communications is at least 5". This limitation is indefinite because it is unclear what units are to be used in the calculation of the claimed ratio. For example, it is not clear how the radius of the coverage area is to be calculated (in feet, in miles, in meters, in kilometers?).

Line 1 of **claim 11** states "said radio frequency interface". Since there are mentions of both a "first radio frequency interface" and a "second radio frequency

interface" in claim 9, which claim 11 depends on, it is unclear as to which radio frequency interface is being discussed in claim 11. Appropriate correction is required.

Lines 5-6 of **claim 58** state "a ratio of maximum radius of a cell of said cellular configuration to an order of signal modulation is at least two". This limitation is indefinite for two reasons. First, it is unclear what units are to be used in the calculation of the claimed ratio. For example, it is not clear how the radius of the coverage area is to be calculated (in feet, in miles, in meters, in kilometers?). Second it is not clear what is meant by "an order of signal modulation".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 29, 32, 37, 38, 39, and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by Chambers et al. (U.S. Pat. 5867485).

With respect to claim 29, Chambers et al. discloses a receiver, in a subscriber station 16, and transmitter, in a remote node transceiver 14, which transmit using radio frequency **(See column 4 line 64 to column 5 line 9 and Figure 1 of Chambers et al.**

for reference a remote node transceiver transmitting to a subscriber station using radio-frequency energy). Chambers et al. also discloses using orthogonal frequency division multiplexing **(See column 4 lines 38-47 of Chambers et al. for reference to using OFDM)**. All OFDM system inherently uses symbols, which are detected on a symbol-by-symbol manner at the receiver. Chambers et al. further inherently discloses transmitting with out a training symbol since there is not mention of an OFDM training symbol being used in the reference.

With respect to claim 32, Chambers et al. discloses transmitting using OFDM **(See column 4 lines 38-47 of Chambers et al. for reference to using OFDM)**, which inherently implies that the system must use OFDM symbols, which have detecting aiding information used by a receiver.

With respect to claim 37 and 38, Chambers et al. using quadrature phase-shift keying sub-symbols, which is a result of QPSK modulation **(See column 7 lines 42-45 of Chambers et al. for reference to using QPSK)**.

With respect to claim 39, Chambers et al. discloses using a 1:1 frequency reuse pattern **(See column 7 lines 12-25 of Chambers et al. for reference to frequency reuse factors of one)**.

With respect to claim 41, Chambers et al. discloses that the transmitter and receiver are either a base station unit, remote node transceiver 14, or a computer premise equipment, subscriber station 16 **(See column 4 line 64 to column 5 line 9 and Figure 1 of Chambers et al. for reference to the remote node transceiver 14**

and subscriber station 16 both having the capability of transmitting and receiving RF data).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 5, 6, 9, 10, 11, 12, 50, 54, 55, 56, 57, 60, 61, 62, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Wickman et al. (WO 98/26520).

With respect to claim 1, Chambers et al. discloses a microcellular network operating in a frequency range of less than 10 GHz **(See column 2 lines 62-64 of Chambers et al. for reference to operating in frequency ranges of 2150-2162 MHz and 2500-2686 MHz)**. Chambers et al. also discloses a plurality of base stations, remote node transceivers 14 **(See column 4 line 64 to column 5 line 9 and Figure 1 of Chambers et al. for reference to remote node transceivers 14)**. Chambers et al. further discloses communicating using OFDM on a set of frequency channels **(See column 4 lines 38-47 of Chambers et al. for reference to using OFDM)**. Chambers et al. further discloses a plurality of consumer premise equipment, subscriber stations 16, assigned to base stations and located in the coverage are of the base stations **(See**

column 4 line 64 to column 5 line 9 and Figure 1 of Chambers et al. for reference to subscriber stations 16 in the coverage area of remote node transceivers 14). Chambers et al. does not disclose the base stations having a coverage area between 1 and 10 miles. Chambers et al. also does not disclose the consumer premise equipment having an antenna deployed internally within the premise where the CPE is located.

With respect to claim 5, the combination of Chambers et al. discloses using an ALOHA medium access scheme **(See column 8 lines 48-50 of Chambers et al for reference to connection management being handled by a slotted aloha protocol).**

With respect to claim 6, Chambers et al. discloses each base station, remote node transceiver 14, including less than 10 sector-oriented antennas **(See column 7 lines 1-4 of Chambers et al. for reference to having at least 3 radiating sectors, which inherently must have at least 3 sector-oriented antennas).** Chambers et al. also discloses each sector-oriented antenna using a different set of channels **(See column 7 lines 1-12 of Chambers et al. for reference to sectors using cross polarization between adjacent cells, which implies that each sector uses a separate set of frequency channels to prevent interference).**

With respect to claim 9, Chambers et al. discloses a wireless access system comprising a base station unit, remote node transceiver 14, that includes a network interface, fiber optic links 12 **(See column 6 lines 1-8 and items 12 and 14 in Figure 2 for reference to remote node transceiver 14 including a fiber optic link 12).** Chambers et al. also discloses a radio frequency interface and a switch capable of switching an information packet to the base station, remote node transceiver 14, from

the network, fiber optic network, and from the base station to the network **(See column 6 line 1 to column 7 line 51 and Figure 3 of Chambers et al. for reference to radio frequency transmit and receive antennas, which are capable of transmitting and receiving data packets via radio frequency and for reference to fiber optic receivers, which inherently includes a packet switch, for sending and receiving packets to and from the fiber optic network)**. Chambers et al. further discloses a customer premise equipment, subscriber station, including a host interface, network interface unit 60 **(See column 7 line 54 to column 8 line 21 and Figures 4 and 5 of Chambers et al. for reference to the subscriber station containing a NIU 60)**. Chambers et al. also discloses a second radio frequency interface and a second switch to send and receive packets between the host, subscriber, equipment and the radio frequency interface **(See column 7 line 54 to column 9 line 57 and Figures 4 and 5 of Chambers et al. for reference to a roof mounted radio frequency antenna and its equipment, which transfers packets from the antenna to the subscriber equipment as well as from the subscriber equipment to the antenna, and which must include a packet switch to be able to perform the function of sending data to and from the host equipment using NIU 60)**. Chambers et al. further discloses using orthogonal frequency division multiplexing to transmit and receive packets **(See column 4 lines 37-48 of Chambers et al. for reference to using OFDM)**. Chambers et al. does not disclose that the second radio frequency interface enables non-line-of-sight radio frequency transmission.

With respect to claim 10, Chambers et al. discloses that the host is either a single host computer or a network of host computers **(See column 9 lines 23-39 and item 64 of Figure 4 for reference to the host being a computer)**.

With respect to claim 11, Chambers et al. does not disclose that the radio frequency interfaces operate in the 2.5-2.686 GHz range.

With respect to claim 12, Chambers et al. that the network and host interface comprise an Ethernet interface **(See column 9 line 23-39 and item 64 of Figure 4 of Chambers et al. for reference to using Ethernet, which inherently means there must be an Ethernet interface in the NIU 60 and the PC 64)**.

With respect to claim 50, Chambers et al. discloses a method of establishing communication between a computer premise equipment, subscriber station 16, and a plurality of base station units, remote node transceivers 14 **(See column 4 line 64 to column 5 line 9 and items 14 and 16 in Figure 1 of Chambers et al. for reference to subscriber units 14 communicating with base stations 16)**. Chambers et al. also discloses that the communication between the base station, remote node transceiver 14, and the CPE unit, subscriber unit 16, is by radio frequency **(See column 4 line 64 to column 5 line 9 and Figure 1 of Chambers et al. for reference to communicating using radio frequency energy)**. The subscriber unit 16 of Chambers et al. must inherently automatically register with the remote node transceivers 14 in order to be able to communicate with the remote node transceivers 14. Chambers et al. further discloses installing a CPE unit to a host, CPU 64 **(See column 9 lines 23-39 and item 64 of Figure 4 of Chamber et al. for reference to a host, CPU 64, being installed to**

the CPE unit, subscriber station 16). Chambers et al. does not disclose that the CPE unit is completely contained with a premise.

With respect to claim 54, Chambers et al. discloses that the CPE unit, subscriber unit 16, is connected to a plurality of hosts, CPU 64, phone 66, and television 62 **(See column 9 lines 23-39 and items 62, 64, and 66 in Figure 4 of Chambers et al. for reference to the subscriber unit 16 being connected to a plurality of hosts)**. The subscriber station 16 of Chamber et al. also must inherently pass the address of the hosts, for example, the CPU 64 and the phone 66, to the remote node transceiver 14 so that the remote node transceiver 14 can determine which packets to route to the subscriber unit 16.

With respect to claim 55, Chambers et al. discloses that the host is selected from a group consisting of a single host computer and a network of a plurality of host computers **(See column 9 lines 23-39 and item 64 in Figure 4 of Chambers et al. for reference to a host attached to subscriber station 16 being a single CPU 64)**.

With respect to claim 56, Chambers et al. discloses that the connection between the host, CPU 64, and the CPE unit, subscriber station 16, is an Ethernet connection **(See column 9 lines 23-39 and Figure 4 of Chambers et al. for reference to the connection between subscriber station 16 and CPU 64 being an Ethernet connection)**.

With respect to claim 57, Chambers et al. discloses that the radio frequency communication is less than 10 GHz **(See column 2 lines 62-64 of Chambers et al. for**

reference to operating in frequency ranges of 2150-2162 MHz and 2500-2686 MHz).

With respect to claim 60, Chambers et al. discloses a wireless system with a plurality of computer premise equipment units, subscriber stations 16, and a plurality of base station units, remote node transceivers 14, with the CPEs communicate with the base stations using radio frequency **(See column 4 line 64 to column 5 line 9 and items 14 and 16 in Figure 1 for reference to remote node trasceivers 14 communicating with subscriber stations 16 using radio frequency energy).** Chambers also discloses that he base station units are arranged in a sectorized configuration with up to 250 CPE units in each sector **(See column 7 lines 1-4 and Figure 1 of Chambers et al. for reference to the remote node transceivers 14 having sectors and for reference to the system having 6 subscribe homes, as shown in Figure 1, which includes the limitation of up to 250 CPE units).** Chambers et al. does not disclose each sector having a radius of less than 10 miles.

With respect to claim 61, Chambers et al. discloses that the sectorized configuration is maintained in a cellular configuration **(See column 7 lines 1-12 of Chambers et al. for reference to the sectors being in a cellular configuration).**

With respect to claim 62, Chambers et al. discloses that there can be six sectors per cell **(See column 7 lines 1-4 of Chambers et al. for reference to there being at least 3 sectors, which includes the possibility of six sectors).**

With respect to claim 63, Chambers et al discloses that the cellular configuration has a 1:1 reuse pattern **(See column 7 lines 12-25 of Chambers et al. for reference to frequency reuse factors of one)**.

Wickman et al., in the field of communications, discloses base stations having a coverage range between 1 and 10 miles, or less than 10 miles **(See page 7 line 20 of Wickman et al. for reference to a radius of tens of kilometers, which can be between 1 and 10 miles and less than 10 miles)**. Wickman et al. also discloses customer premise equipment with an internally deployed, non-line-of-sight antenna **(See page 11 lines 34-36 of Wickman et al. for reference to using not-line-in-sight radio connections meaning an antenna may be deployed internally)**. Wickman et al. further discloses using frequencies in the 2.5-2.686 GHz range **(See page 7 lines 3-5 of Wickman et al. for reference to wireless communications in the 2.5 GHz range)**. Using non-line-of-sight radio base stations communicating in the 2.5 GHz range and having a communication radius of less than 10 miles has the advantage of allowing antennas to be deployed without worrying about obstacles between the base station and receiver, the advantage of communicating in a 2.5 GHz range, which provides a large bandwidth for different channels, and the advantage of making sure that no interference from the system will happen 10 miles outside the system.

It would have been obvious to one of ordinary skill in the art, when presented with the work of Wickman et al., to combine the use of non-line-of-sight radio base stations communicating in the 2.5 GHz range and having a communication radius of less than 10 miles, as suggested by Wickman et al., with the wireless system of

Chambers et al., with the motivation being to allow antennas to be deployed without worrying about obstacles between the base station and receiver, communicate in a 2.5 GHz range, which provides a large bandwidth for different channels, and to make sure that no interference from the system will happen 10 miles outside the system.

8. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Wickman et al. as applied to claims 1, 5, 6, 9, 10, 11, 12, 50, 54, 55, 56, 57, 60, 61, 62, and 63 above, and further in view of *Adaptive Antennas for OFDM* by Vook et al. from Vehicular Technology Conference, 48th IEEE Ottawa, Canada.

With respect to claim 2, the combination of Chambers et al. and Wickman et al. does not disclose a bit error rejection rate of 10x10^-6.

With respect to claim 3, Chambers et al. discloses using QPSK **(See column 7 lines 42-45 of Chambers et al. for reference to using QPSK)**.

Vook et al., in the field of communications, suggest that lower bit error rate is more optimum and shows a BER of 10x10^-6 as optimum **(See page 608-610 and Figure 3 for reference to optimum BER approaching 10x10^-6)**. Having a lower BER has the advantage of having less corrupt packet data in the wireless network.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Vook et al., to combine the BER of 10x10^-6 as suggested by Vook et al., with the wireless system of Chambers et al. and Wickman et al., with the motivation being to have less corrupt packet data in the network.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Wickman et al. as applied to claims 1, 5, 6, 9, 10, 11, 12, 50, 54, 55, 56, 57, 60, 61, 62, and 63 above, and further in view of *Radio Resources Allocation in Fixed Broadband Wireless Networks* by Fong et al. from IEEE Transactions on Communications Vol. 46 No. 6.

With respect to claim 4, the combination of Chambers et al. and Wickman et al. does not disclose channels of a first base station being reused by a second adjacent base station.

Fong et al., in the field of communications, discloses reusing channels in adjacent base stations **(See page 806 right hand column of Fong et al. for reference to reusing channels in every cell, which includes adjacent cells)**. Reusing channels has the advantage of leaving more channels available for use in each base station.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Fong et al., to combine the reuse of channels in adjacent base stations, with the wireless system of Chambers et al. and Wickman et al., with the motivation being to leave more channels available for use in each base station.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Wickman et al. as applied to claims 1, 5, 6, 9, 10, 11, 12, 50, 54, 55, 56, 57, 60, 61, 62, and 63 above, and further in view of Deutsche (GB 2319709).

With respect to claim 7, the combination of Chambers et al. and Wickman et al. does not disclose an efficiency ratio being at least 0.75.

Deutsche, in the field of communications, discloses an efficiency ratio of at least 0.75 **(See page 5 lines 6-7 of Deutsche for reference to an efficiency of about 0.75 bits/s/Hz per channel)**. Having a high efficiency ratio has the advantage of lowering the amount of transmitter power needed in a base station.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Deutsche, to combine the a system with an efficiency ratio of 0.75, with the wireless system of Chambers et al. and Wickman et al., with the motivation being to lower the amount of transmitter power needed in a base station of the system.

11. Claims 13, 14, 15, 16, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Wickman et al. as applied to claims 1, 5, 6, 9, 10, 11, 12, 50, 54, 55, 56, 57, 60, 61, 62, and 63 above, and further in view of Seazholtz et al. (U.S. Pat. 6246875).

With respect to claim 13, Chambers et al. discloses base stations, remote node transceivers 14, arranged in a cellular structure **(See column 3 lines 10-28 and item 14 in Figure 1 of Chambers et al. for reference to remote node transceivers**

arranged as cells in a network architecture). The remote node transceivers 14 must inherently emit a signal to be able to communicate with the subscriber stations 16. The subscriber stations 16 also must inherently register with the remote nod transceivers in some way to be able to send data packets to the remote node transceivers 14. The combination of Chambers et al. and Wickman et al. does not disclose CPE units registering with base stations based on signal quality of the signal from the base station units.

With respect to claim 14, the combination of Chambers et al. and Wickman et al. does not disclose CPE units searching for and registering with a new base station based on signal quality upon losing signal quality with the current registered base station.

With respect to claim 15, the CPE units, subscriber stations 16 of Chambers et al., must inherently pass the address of the host connected to it to the base station unit, remote node transceiver 14, as with any network, so that the base station unit will be able to correctly route packets which are destined for the host address.

With respect to claim 16, the combination of Chambers et al. and Wickman et al. does not disclose that when a CPE unit registers with a new base station unit, the new base station unit cause updating of the base station unit to which the CPE unit was previously registered, making it aware of the new registration.

With respect to claim 51, the combination of Chambers et al. and Wickman et al. does not disclose that registering is base upon a quality of signal emitted by the base station unit.

Seazholtz et al., in the field of communications, discloses a CPE, end user station, registering with a base station, mobile data base station, based on quality of the signal **(See column 34 lines 1-17 of Seazholtz et al. for reference to an end user station registering with a mobile data base station based on signal strength)**. Seazholtz et al. also discloses searching for and registering with a new base station when the current base station is losing signal quality **(See column 18 lines 23-51 of Seazholtz et al. for reference to handing off to a new base station when the signal of the current base station is weakening based on the signal strength of the new base station)**. Seazholtz et al. further discloses updating of a subscriber list to make base stations aware of a mobile unit registering with a new base station **(See column 19 lines 18-28 of Seazholtz et al. for reference to updating a SID list when mobiles units register with new stations)**. Registering with base stations based on signal quality and providing indication that a CPE unit has registered with a new base station has the advantage of improving system performance by making sure communications are made using the strongest possible signal and making sure that each base station in the system can accurately route packets to CPE units which have change the base station they are registered to.

It would have been obvious to one of ordinary skill in the art at the time of the invention, when presented with the work of Seazholtz et al. to combine register based on signal strength and making base station units aware of changing registrations, as suggested by Seazholtz et al., with the communications system of Chambers et al. and Wickman et al., with the motivation being to improve system performance by making

sure communications are made using the strongest possible signal and making sure that each base station in the system can accurately route packets to CPE units which have change the base station they are registered to.

12. Claims 17, 18, 19, 21, 22, 23, 24, 25, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Meier et al. (U.S. Pat. 6046992).

With respect to claim 17, Chambers et al. discloses a wireless access system with a plurality of base station units, remote node transceivers 14, arranged in a cellular structure connectable to a network **(See column 3 lines 10-28 and item 14 in Figure 1 of Chambers et al. for reference to remote node transceivers arranged as cells in a network architecture)**. Chambers et al. also discloses customer premise equipment, subscriber stations which communicate by a radio frequency and are connectable to a host **(See column 7 line 54 to column 8 line 21 and Figure 4 of Chambers et al. for reference to subscriber stations communicating with remote node transceivers using RF and connecting to host devices using NIU 60)**. Chambers et al. does not disclose the CPE unit learning a high-level Internet protocol address and a low-level physical address of the host by observing communication traffic.

With respect to claim 18, Chambers et al. does not disclose the high-level Internet protocol address comprising a level 3 address and the low-level physical address comprising an Ethernet physical layer address.

With respect to claim 19, does not disclose that the communication traffic comprises an address request from the host and a response from a network server.

With respect to claim 21, Chambers et al. does not disclose the CPE unit creating a table of Internet protocol address and physical addresses.

With respect to claim 22, Chambers et al. does not disclose the base station learning of high and low level addresses of the CPE unit and host by observing communication traffic.

With respect to claim 23, Chambers et al. does not disclose the base station unit creating a table of high and low level addresses for the CPE unit and host.

With respect to claim 24, Chambers et al. inherently discloses that the CPE unit transmits a mess age to the base station only if the message is directed to a host that is not listed in the table of the CPE unit because the subscriber station of Chamber et al. only sends packets to the remote transceiver node when a packet is addressed to an outside host, not connected to the subscriber station.

With respect to claim 25, Chambers et al. inherently discloses that he base station unit, remote node transceiver, transmits a message to a CPE unit, subscriber station, only if the CPE unit is within a table of the base station unit, because if the remote node transceiver of Chambers et al. does not know of a subscriber station, it cannot send a message to it.

Meier et al., in the field of communications, discloses leaning addresses by observing communication traffic **(See column 6 lines 38-65 of Meier et al. for reference to leaning addresses by monitoring communication traffic)**. Meier et al. also discloses learning both a high and low level physical address, which are an internet protocol address and an Ethernet physical layer address, a MAC address **(See column**

9 lines 22-31 and column 10 lines 3-16 of Meier et al. for reference to devices using the medium access control layer, which implies they must learn the physic MAC address of hosts and for reference to using higher layers, which include layer 3, meaning devices must learn the internet protocol address as well). Meier et al. further discloses making and using a table of addresses **(See column 6 liens 38-65 of Meier et al. for reference to creating and updating a routing table of addresses made by observing communication traffic)**. Learning and storing lower and higher level host addresses by observing communication traffic has the advantage of allowing both CPE units and base station units to have an accurate routing table of the network which is dynamically updated.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Meier et al., to combine learning and storing lower and higher level host address by observing communication traffic with the communication system of Chambers et al., with the motivation being to allow both CPE units and base station units to have an accurate routing table of the network which is dynamically updated.

13. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Meier et al. as applied to claims 17, 18, 19, 21, 22, 23, 24, and 25 above, and further in view of *DHCP for Mobile Networking* by Perkins et al. from IEEE Symposium on Computers and Communications, June 1995.

With respect to claim 20, the combination of Chambers et al. and Meier et al. does not disclose using dynamic host control protocol.

Perkins et al., in the field of communications, discloses using DHCP in a mobile communications environment **(See the Conclusions section on page 261 of Perkins et al. for reference to there being uses for DHCP in a mobile data communications environment)**. Using DHCP has the advantage of allowing routing tables of address to be dynamically updated by observing traffic.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Perkins et al., to combine the use of DHCP, as suggested by Perkins et al., with the mobile communications system of Chambers et al. and Meier et al., with the motivation being to allow routing tables of address to be dynamically updated by observing traffic.

14. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Meier et al. as applied to claims 17, 18, 19, 21, 22, 23, 24, and 25 above, and further in view of Akatsu et al. (U.S. Pat. 6496862).

With respect to claims 26 and 27, the combination of Chambers et al. and Meier et al. does not disclose using performing address resolution protocol proxy to reduce radio frequency traffic.

Akatsu et al., in the field of communications, discloses using address resolution protocol to find a physical layer address from an Internet address **(See column 12 line 15 to column 13 line 15 and Figure 22B for reference to using ARP)**. Using ARP

inherently will reduce radio frequency traffic since know all the physical addresses of host will allow for more efficient routing. Using ARP has the advantage of allowing a device to find a physical layer address from an Internet address.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work Akatsu et al., to combine the use of address resolution protocol, as suggested by Akatsu et al., with the mobile communication system of Chambers et al. and Meier et al., with the motivation being to allow a device to find a physical layer address from an Internet address.

15. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Meier et al. as applied to claims 17, 18, 19, 21, 22, 23, 24, and 25 above, and further in view of Wickman et al.

With respect to claim 28, the combination of Chambers et al. and Meier et al. does not disclose radio frequency in the range of 2.5-2.686 GHz.

Wickman et al., in the field of communications, discloses using frequencies in the 2.5-2.686 GHz range **(See page 7 lines 3-5 of Wickman et al. for reference to wireless communications in the 2.5 GHz range)**. Using frequencies in the 2.5 GHz range has the advantage of providing a large bandwidth for different communication channels.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Wickman et al., to combine the use of radio frequencies in the 2.5 GHz range, as suggested by Wickman et al., with the mobile

communications system of Chambers et al. and Meier et al., with the motivation being to provide a large bandwidth for different communication channels.

16. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Alamouti et al. (U.S. Pat. 5838728).

With respect to claims 30 and 31, Chambers et al. does not disclose using a Reed/Solomon ½-rate convolutional encoder to correct for burst errors.

Alamouti et al., in the field of communications, discloses using a Reed-Solomon encoder to compensate for errors **(See column 13 lines 36-48 of Alamouti et al. for reference to using a Reed-Solomon encoder)**. Choosing a ½-rate Reed/Solomon convolutional encoder is only a design choice depending on how much redundancy is needed to compensate for errors. Using Reed-Solomon encoding has the advantage of adding data for error correction to a transmission.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Alamouti et al., to combing the Reed/Solomon encoder of Alamouti et al. with the mobile communications system of Chambers et al., with the motivation being to add data for error correction to the transmission.

17. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of *Time and Frequency Offset in OFDM Systems*

Employing Pulse Shaping by Landstrom et al. In Proceedings of IEEE International Conference on Universal Personal Communication, October 1997.

With respect to claim 33, Chambers et al. does not disclose the OFDM signal including a cyclical prefix used to determine time of the OFDM signal.

With respect to claim 34, Chambers et al. does not disclose using the cyclical prefix to determine a fine frequency for the OFDM signal.

Landstrom et al., in the field of communications, discloses using a cyclical prefix to determine both time and frequency of an OFDM signal **(See the conclusions section on page 282 of Landstrom et al. for reference to using a cyclic prefix to determine both time and frequency offset in a multi-user OFDM system)**. Using a cyclic prefix has the advantage of providing a reliable way to gain both time and frequency synchronization in a system using OFDM.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Landstrom et al., to combing the cyclic prefix of Landstrom et al., with the mobile communication system of Chambers et al., with the motivation being to provide a reliable way to gain both time and frequency synchronization in a system using OFDM.

18. Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Keevill et al. (U.S. Pat. 6359938).

With respect to claim 35, Chambers et al. does not disclose pilot sub-symbols being used by the receiver to determine a fine timing of the OFDM signal.

With respect to claim 36, Chambers et al. does not disclose pilot sub-symbols being used by the receiver to determine a coarse frequency of the OFDM signal.

Keevill et al., in the field of communications, discloses using pilot signals to determine and correct for frequency error and timing errors in a system using OFDM **(See column 34 lines 9-30 of Keevill et al. for reference to using pilot signals to determine and correct for both frequency and timing errors)**. Using a pilot signal has the advantage of providing a reliable way to gain both time and frequency synchronization in a system using OFDM.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Keevill et al., to combine the use of pilot signals, as suggested by Keevill et al., with the mobile communications system of Chambers et al., with the motivation being provide a reliable way to gain both time and frequency synchronization in a system using OFDM.

19. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Agee (U.S. Pat. 6128276).

With respect to claim 40, Chambers et al. does not disclose using nulled center bits.

Agee, in the field of communications, discloses using code nulling **(See the abstract of Agee for reference to using code-nulling in an OFDM system)**. Agee also discloses that code nulling has the advantages of canceling interference and

enhancing signal separation by exploiting spectral diversity of sources **(See the abstract of Agee for reference to these advantages)**.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Agee, to combing the code nulling of Agee, with the mobile communication system of Chambers et al., with the motivation being to cancel interference and enhance signal separation by exploiting spectral diversity of sources.

20. Claims 42, 43, 44, 45, 46, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Fattouche et al. (Canadian Pat. 2064975).

With respect to claim 42, Chambers et al. discloses a wireless communication system with a first transceiver, a remote node transceiver 14, and a second transceiver, subscriber station 16, communicating over a radio frequency air link permitting both uplink and downlink transmissions **(See column 4 line 64 to column 5 line 9 and items 14 and 16 in Figure 1 of Chambers et al. for reference to a remote node transceiver 14 and a subscriber station 16 communicating both uplink and downlink transmissions using radio frequency energy)**. Chambers et al. also discloses the transceivers using orthogonal frequency division multiplexing modulation **(See column 4 lines 38-47 of Chambers et al. for reference to using OFDM)**. Chambers et al. does not disclose the downlink transmission being unframed and the uplink transmission being framed.

With respect to claims 43 and 44, Chambers et al. discloses providing slotted-aloha media access with implicit reservation slots for a message **(See column 8 lines 48-50 of Chambers et al. for reference to using slotted-aloha)**. Since Chambers et al. discloses using slotted-aloha media access, Chambers et al. inherently must use a media access control protocol to establish the air link.

With respect to claim 45, Chambers et al. inherently discloses that the downlink frame must include a destination address field, since there would be no way for a subscriber station to route a received packet if there were no destination address field.

With respect to claim 46, Chambers discloses that the uplink transmission is presented within a fixed number of uplink slots, channels **(See column 7 lines 54-61 of Chambers et al. for reference to send upstream data in fixed channels)**.

With respect to claim 48, Chambers et al. does not disclose that transmissions are time division duplexed.

With respect to claim 49, Chambers et al. does not discloses that transmissions are made in uplink and downlink slots with a variable ratio of downlink slots to uplink slots.

Fattouche et al., in the field of communications, discloses unframed downlink and framed uplink communications **(See page 35 line 33 to page 36 line 10 of Fattouche et al. for reference to one transceiver continuously transmitting a signal an anther transceiver transmitting a signal in frames 1-9)**. Fattouche et al. also discloses that transmissions are time division duplexed **(See the abstract of Fattouche et al. for reference to transceiver exchanging information in a time duplexed manner)**.

Fattouche et al. further discloses transmitting in slots with a variable ratio of downlink slots to uplink slots **(See page 17 lines 24-33 of Fattouche et al. for reference to transmitting data in frames and the amount of frames using being variable, up to 21)**. Using time division duplexing and transmitting data using frames has the advantage of providing a way for two-way communications using one channel.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Fattouche et al., to combine the use of framed and unframed time division duplexing, as suggested by Fattouche et al., with the mobile communication system of Chambers et al., with the motivation being to provide a way for two-way communications using one channel.

21. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Fattouche et al. as applied to claims 42, 43, 44, 45, 46, 48, and 49 above, and further in view of Seazholtz et al.

With respect to claim 47, the combination of Chambers et al. and Fattouche et al. does not disclose an uplink channel status field including quality of service.

Seazholtz et al., in the field of communications, discloses using a status field, a Received Signal Strength Indication, which indicates the quality of communication channels **(See column 14 lines 54-62 of Seazholtz et al. for reference to the Received Signal Strength Indication)**. Using a channel status field including qulatiy of service has the advantage of allowing mobile units to gain information about channel quality so that they may transmit using the strongest channel.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Seazholtz et al., to combine the use of a Received Signal Strength Indication, as suggested by Seazholtz et al., with the mobile communication system of Chambers et al. and Fattouche et al., with the motivation being to allow mobile units to gain information about channel quality so that they may transmit using the strongest channel.

22. Claim 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chambers et al. in view of Wickman et al. as applied to claims 1, 5, 6, 9, 10, 11, 12, 50, 54, 55, 56, 57, 60, 61, 62, and 63 above and further in view of Terashima et al. (U.S. Pat. 5943396).

With respect to claim 52, the combination of Chambers et al. and Wickman et al. does not discloses a base station unit determining whether registration of a CPE unit is allowed.

With respect to claim 53, the combination of Chambers et al. and Wickman et al. does not disclose a base station denying or acknowledging the CPE unit.

Terashima et al., in the field of communications, discloses determining whether registration of a CPE unit, a mobile station, is allowed by a base station unit, and the base station either acknowledging or denying the CPE unit, mobile station **(See column 2 lines 40-54 of Terashima et al. for reference to operation of a cellular system being allowed by a base station only when a mobile station identification code matches a system identification code registered in the system)**. Denying or

acknowledging a CPE unit has the advantage of making sure that only subscribed users are allowed to access the communications system.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Terashima et al., to combine denying or allowing access to a mobile station by a base station, as suggested by Terashima et al., with the mobile communication system of Chambers et al. and Wickman et al., with the motivation being to make sure that only subscribed users are allowed to access the communications system.

Allowable Subject Matter

23. Claims 8 and 58 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

24. The following is a statement of reasons for the indication of allowable subject matter: With respect to claims 8 and 58, once the correct units for the calculation of the claimed ratios are specified, and if a further search finds no prior art to reject the ratio limitations, the claims would be allowable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason E Mattis whose telephone number is (703) 305-8702. The examiner can normally be reached on M-F 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (703) 305-4798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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PRIMARY EXAMINER